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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,771	09/22/2003	Yusuke Igarashi	14225-024001 / F1030479US	1356
26211	7590	03/01/2006	EXAMINER	
FISH & RICHARDSON P.C. P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			VINH, LAN	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 03/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/667,771

Applicant(s)

IGARASHI ET AL.

Examiner

Lan Vinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>121905</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 19, 21-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Fukutomi et al (US 2002/0039808A1)

Fukutomi discloses a semiconductor package fabrication process comprises the steps of:

providing a multilayer substrate including a multilayer wiring on a supporting copper foil 1/conductive film (col 6, paragraph 0128) ; wherein the multilayer wiring includes a patterned first wiring layer 13 (copper), a resin/ insulating layer 12 which covers the first wiring layer 13, an opening portion wherein a part of the insulating layer is opened and the first wiring layer13 is exposed (col 6, paragraph 0130; fig. 3b), and a second wiring layer 11 electrically connected to the first wiring layer 13 via copper plated in the opening portion (col 6, paragraph 0130); and wherein nickel layer/barrier film made of a different material from the supporting conductive film is provided between the first wiring layer and the supporting conductive film (col 5, paragraph 0126, fig. 1b)

mounting a chip 3/semiconductor element so that the semiconductor element electrically connects to the second wiring layer 11 by the copper plated in the opening (col 6, paragraph 0130)

covering the semiconductor element with a sealing resin layer 5 (fig. 3d)
thoroughly removing the copper foil 1/supporting conductive film to expose the nickel/barrier film (col 6, paragraph 0128; fig. 3e)

The limitations of claims 21, 23 have been discussed above

Regarding claims 22, 25, Fukutomi discloses plating the nickel layer on the copper foil 1 (col 5, paragraph 0126), which reads on the nickel layer/barrier layer protects the copper foil and the wiring layer 13/first wiring when the copper foil 1 is removed

Regarding claim 24, fig. 3a shows that copper foil 1/supporting conductive film is thicker than wiring layer 13

3. Claims 26, 28-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Fukutomi et al (US 2002/0039808A1)

Fukutomi discloses a semiconductor package fabrication process comprises the steps of:

providing a multilayer substrate including a multilayer wiring on a supporting copper foil 1/conductive film (col 6, paragraph 0128) ; wherein the multilayer wiring includes a patterned first wiring layer 13 (copper) on the copper foil 1, a resin/ insulating layer 12 which covers the first wiring layer 13, an opening portion wherein a part of the insulating layer is opened and the first wiring layer13 is exposed (col 6, paragraph 0130; fig. 3b),

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and a second wiring layer 11 electrically connected to the first wiring layer 13 penetrating the insulating layer 12 via copper plated in the opening portion (col 6, paragraph 0130; fig. 3b); and wherein nickel layer/barrier film made of a different material from the supporting conductive film is provided between the first wiring layer and the supporting conductive film (col 5, paragraph 0126, fig. 1b)

mounting a chip 3/semiconductor element so that the semiconductor element electrically connects to the second wiring layer 11 by the copper plated in the opening (col 6, paragraph 0130)

covering the semiconductor element with a sealing resin layer 5 (fig. 3d)
thoroughly removing the copper foil 1/supporting conductive film to expose the nickel/barrier film (col 6, paragraph 0128; fig. 3e)

Regarding claims 28, 29, Fukutomi discloses plating the nickel layer on the copper foil 1 (col 5, paragraph 0126), which reads on the nickel layer/barrier layer protects the copper foil and the wiring layer 13/first wiring when the copper foil 1 is removed

Regarding claim 30, fig. 3a shows that copper foil 1/supporting conductive film is thicker than wiring layer 13

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 20, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukutomi et al (US 2002/0039808A1) in view of Petti et al (US 6,120,693)

Fukutomi method has been described above. Fukutomi differs from the instant claimed inventions as per claims 20, 27 by using nickel barrier layer instead of silver

Petti, in a method for manufacturing a semiconductor device, discloses using nickel, silver as barrier layer for a copper layer (col 5, lines 35-45)

One skilled in the art at the time the invention was made would have found it obvious to modify Fukutomi method by substituting nickel with silver in view of Petti teaching because Petti discloses that nickel, silver are suitable metals used as a secondary metal/barrier layer to prevent the oxidation of the primary metal layer (col 5, lines 40-45)

Response to Arguments

6. Applicant's arguments with respect to claims 19-30 have been considered but are moot in view of the new ground(s) of rejection. The argument that the reference of Iijima does not disclose a step in which a supportive conductive film is thoroughly removed to expose the barrier film is moot in view of the new ground of rejection based on Fukutomi wherein the copper foil 1/supporting conductive film is completely removed to expose the nickel/barrier film

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to be 'LV' followed by a stylized flourish.

LV
February 24, 2006